

ded in those bubbles, by the losing of their agitation, by the decrease of the Heat, lose also most part of their Spring and Expansive power; it follows (the withdrawing of the heat being very sudden) that the parts must be left in a very loose Texture, and by reason of the implication of the parts one about another, which from their sluggishness and glutinousness I suppose to be much after the manner of the sticks in a Thorn-bush, or a Lock of Wool; It will follow, I say, that the parts will hold each other very strongly together, and endeavour to draw each other neerer together, and consequently their Texture must be very hard and stiff, but very much rarified.

And this will make probable my next Position, That the parts of the Glass are under a kind of tension or flexure, out of which they endeavour to extricate and free themselves, and thereby all the parts draw towards the Center or middle, and would, if the outward parts would give way, as they do when the outward parts cool leisurely (as in baking of Glasses) contract the bulk of the drop into a much less compass. For since, as I proved before, the Internal parts of the drop, when fluid, were of a very rarified Texture, and, as it were, to be open like a Lock of Wool, and if they were suffered leisurely to cool, would be again prest, as it were, close together: And since that the heat, which kept them bended and open, is removed, and yet the parts not suffered to get as neer together as they naturally would; It follows, that the Particles remain under a kind of tension and flexure, and consequently have an endeavour to free themselves from that bending and distension, which they do, as soon as either the tip be broken, or as soon as by a leisurely heating and cooling, the parts are nealed into another posture.

And this will make my next Position probable, that the parts of the Glass drops are contignated together in the form of an Arch, and cannot any where yield or be drawn inwards, till by the removing of some one part of it (as it happens in the removing one of the stones of an Arch) the whole Fabrick is shatter'd, and falls to pieces, and each of the Springs is left at liberty, suddenly to extricate itself: for since I have made it probable, that the internal parts of the Glass have a contractive power inwards, and the external parts are incapable of such a Contraction, and the figure of it being spherical; it follows, that the superficial parts must bear against each other, and keep one another from being condens'd into a less room, in the same manner as the stones of an Arch conduce to the upholding each other in that Figure. And this is made more probable by another Experiment which was communicated to me by an excellent Person, whose extraordinary Abilities in all kind of Knowledg, especially in that of Natural things, and his generous Disposition in communicating, encouraged me to have recourse to him on many occasions. The Experiment was this: Small Glass-balls (about the bigness of that represented in the Figure &c.) would, upon rubbing or scratching the inward Surface, fly all insunder, with a pretty brisk noise; whereas neither before nor after the inner Surface had been thus scratcht, did there appear any flaw or crack. And putting the pieces of one of those broken ones together again, the flaws appeared much after the manner of the black lines on the Figure, &c. These Balls were small, but exceeding thick bubbles of Glass, which being crack'd off from the Puntilion whilst very hot, and so suffered to cool without nealing them in the

the Oven over the Furnace, do thereby (being made of white Glass, which cools much quicker then green Glass, and is thereby made much brittler) acquire a very porous and very brittle texture: so that if with the point of a Needle or Bodkin, the inside of any of them be rubbed pretty hard, and then laid on a Table, it will, within a very little while, break into many pieces with a brisk noise, and throw the parts above a span asunder on the Table: Now though the pieces are not so small as those of a fulminating drop, yet they as plainly shew, that the outward parts of the Glass have a great Conatus to fly asunder, were they not held together by the tenacity of the parts of the inward Surface: for we see as soon as those parts are crazed by hard rubbing, and thereby their tenacity spoiled, the springiness of the more outward parts quickly makes a divulsion, and the broken pieces will, if the concave Surface of them be further scratcht with a Diamond, fly again into smaller pieces.

From which preceding considerations it will follow Sixthly, That the sudden flying asunder of the parts as soon as this Arch is any where disordered or broken, proceeds from the springing of the parts; which, endeavouring to extricate themselves as soon as they get the liberty, they perform it with such a quickness, that they throw one another away with very great violence: for the Particles that compose the Crust have a Conatus to lye further from one another, and therefore as soon as the external parts are loosened they dart themselves outward with great violence, just as so many Springs would do, if they were detained and fastened to the body, as soon as they should be suddenly loosened; and the internal parts drawing inward, they contract so violently, that they rebound back again and fly into multitude of small shivers or sands. Now though they appear not, either to the naked Eye, or the Microscope, yet I am very apt to think there may be abundance of small flaws or cracks, which, by reason the strong reflecting Air is not got between the contiguous parts, appear not. And that this may be so, I argue from this, that I have very often been able to make a crack or flaw, in some convenient pieces of Glass, to appear and disappear at pleasure, according as by pressing together, or pulling asunder the contiguous parts, I excluded or admitted the strong reflecting Air between the parts: And it is very probable, that there may be some Body, that is either very rarified Air, or something analogous to it, which fills the bubbles of these drops; which I argue, first, from the roundness of them, and next, from the vivid reflection of Light which they exhibit: Now though I doubt not, but that the Air in them is very much rarified, yet that there is some in them, to such as well consider this Experiment of the disappearing of a crack upon the extruding of the Air, I suppose it will seem more then probable.

The Seventh and last therefore that I shall prove, is, That the gradual heating and cooling of these so extended bodies does reduce the parts of the Glass to a looser and softer temper. And this I found by heating them, and keeping them for a pretty while very red hot in a fire; for thereby I found them to grow a little lighter, and the small Stems to be very easily broken and inapt any where, without at all making the drop fly; whereas

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before